

CLAIMS:

What is claimed is:

1. A method for detecting an object, comprising the steps of:

5 defining expected characteristics of a scattered invisible electromagnetic radiation pattern to be detected at a receiver;

attenuating at least a portion of an invisible electromagnetic radiation field by a presence of an object within a path of invisible electromagnetic radiation, said invisible electromagnetic radiation propagating off axis with respect to the receiver toward a scattering medium; and

10 detecting the attenuation to indicate a presence of the object.

2. The method according to claim 1, wherein the object comprises a low radar profile craft.

15 3. The method according to claim 1, further comprising the step of emitting a beam of electromagnetic radiation and reflectively scattering the electromagnetic radiation.

4. The method according to claim 1, wherein the electromagnetic radiation is selected from the group consisting of cosmic background radiation, terrestrial thermal emissions, earth satellite microwave emissions, and high altitude long endurance craft emissions.

20 5. The method according to claim 1, wherein the electromagnetic radiation is man-made terrestrial origin radiation selected from the group consisting of radio frequency, microwave, and infrared radiation.

25 6. The method according to claim 1, wherein a collimated electromagnetic radiation detector is employed for detecting the attenuation.

7. The method according to claim 1, wherein a receiver detects the attenuation of the
30 electromagnetic radiation, further comprising the step of producing electromagnetic radiation with an electromagnetic radiation source, the source being substantially spaced from the receiver.

8. The method according to claim 1, wherein a transmitter transmits the electromagnetic radiation in narrow swept bands.

9. The method according to claim 1, wherein a transmitter transmits the electromagnetic radiation omni-directionally and a receiver detects attenuation of the electromagnetic radiation, the receiver having an aperture sensitive to electromagnetic radiation in a narrow swept band.

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10. The method according to claim 1, wherein a transmitter generates the electromagnetic radiation, a receiver detects the electromagnetic radiation, said transmitter and receiver having known positions with respect to the Earth, a distance to the object being determined based on the known location of the receiver and the transmitter and by the vector from the receiver to a shadow of the electromagnetic radiation formed by the object on the Earth.

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11. The method according to claim 1, wherein at least two electromagnetic radiation waves are generated by at least two transmitters, and a position of the at least two transmitters and a receiver for detecting the electromagnetic radiation waves with respect to the Earth are known, a distance to the object being determined based on the known location of the receiver and both transmitters and by the vector from the receiver to the shadow from the first transmitter in geometric relationship with the vector from the receiver to the shadow from the second transmitter.

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12. The method according to claim 1, wherein the electromagnetic radiation is generated by a non-cooperating source, wherein the electromagnetic radiation is detected by a receiver having a phased array antenna.

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13. The method according to claim 1, wherein an adaptive background analysis is performed to differentiate dynamic effects from static effects.

14. The method according to claim 1, wherein an identification of the object is made based on a computed distance to the object, the detected attenuation of the electromagnetic radiation, and a predetermined characteristic of the object.

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15. An apparatus for performing the method of claim 1, comprising:
means for storing expected characteristics of scattered electromagnetic radiation to be received at a receiver; and
a receiver for detecting the attenuation to indicate a presence of the object.

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16. A method for detecting an object, comprising the steps of:

defining expected characteristics of diffuse source electromagnetic background radiation to be received at a receiver;

attenuating at least a portion of diffuse source electromagnetic background radiation received at the receiver by a presence of an object; and

5 detecting the attenuation to indicate a presence of the object.

17. An apparatus for performing the method of claim 16, comprising an imaging receiver responsive to earth black body radiation.

10 18. An apparatus for performing the method of claim 16, comprising an imaging receiver responsive to cosmic black body radiation.

19. A method for detecting a characteristic of an object, comprising the steps of:

defining expected characteristics of electromagnetic radiation to be received at a receiver;

15 attenuating at least a portion of electromagnetic radiation received at the receiver by a presence of an object;

varying a wavelength of the electromagnetic radiation; and

20 detecting the relative attenuation at a plurality of electromagnetic radiation wavelengths to indicate a characteristic of the object.

20 20. The method according to claim 19, wherein the plurality of wavelengths include wavelengths larger and smaller than an effective size of the object, and wherein the characteristic is the effective size of the object.

25 21. An apparatus for performing the method according to claim 19, said apparatus comprising a radio transceiver adapted for operating in the 1-100 meter band.